

# PATENT ABSTRACTS OF JAPAN

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(71)Applicant : KANEGAFUCHI CHEM IND CO LTD

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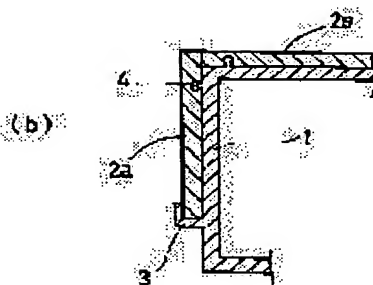
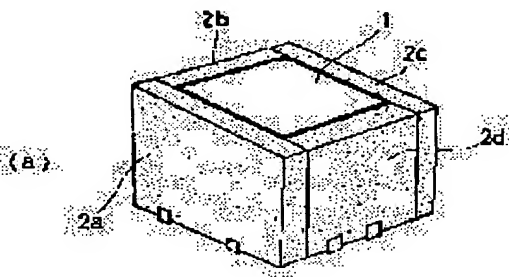
(72)Inventor : KAWAI TAMOTSU  
 ANDO MASAO  
 YAMAMOTO YOSHIHIRO  
 CHIKADA MASAHIRO  
 MASUDA KINZO

## (54) HEAT INSULATING DEVICE FOR BATTERY

## (57)Abstract:

**PURPOSE:** To attain facilitation of mounting/removing a heat insulating pad when changing a discharged battery while evaporation of a fluid can be avoided serving as a battery heat insulating device with neat outward appearance by preventing a discharge in the winter season and impeding a temperature rise in the summer season.

**CONSTITUTION:** In this constitution, a pad material 2, consisting of a foam molded product formed by internal die foaming through extrusion molding or beads method, is formed into a required shape, attached along the external side surface of a battery case and removably/mountably coated.



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**CLAIMS**


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[Claim(s)]

[Claim 1] Heat insulation equipment of the dc-battery characterized by installing the pad material which becomes the lateral surface of a dc-battery case from the foaming object of a necessary configuration, and coming to \*\*\*\* this case lateral surface by this pad material.

[Claim 2] \*\*\*\*\* of a dc-battery case -- the heat insulation equipment of the dc-battery which \*\*\*\* the lower part in said \*\*\*\* engagement section for the pad material which protruded the lock pin on the up location, consisted of a foaming object, countered said lock pin protrusion location, and prepared a crevice while having prepared comparatively the hook-like \*\*\*\* engagement section which \*\*\*\* pad material in a lower location, make a pad material crevice carry out fitting of the upside lock pin, and is characterized by coming to equip a dc-battery case periphery wall surface.

[Claim 3] Heat insulation equipment of the dc-battery according to claim 1 with which independent formation of the pad material is respectively carried out in each wall surface of an ex-battery-limit periphery.

[Claim 4] The heat insulation equipment of the dc-battery which protrudes the space formation member which carries out the partition formation of the space which inserts the pad material installed in each wall surface at the corner section formed of the wall surface which adjoins mutually [ dc-battery case periphery each wall surface ], and can hold it, and is characterized by to have inserted the pad material which consists of a foaming object in the space formed of each space formation member adjoin, respectively, and to make said dc-battery case periphery wall surface \*\*\*\*.

[Claim 5] Heat insulation equipment of a dc-battery given in any of one to claim 4 term formed with the foaming object with which pad material was fabricated by foaming in a mold by extrusion molding or the bead method they are.

[Claim 6] Heat insulation equipment of a dc-battery given in which term of one to claim 5 term which make this front face of the foaming object in a mold by the bead method pad material has a rough front face laminate the resin film or sheet of a monolayer or a double layer, and it comes to constitute.

[Claim 7] A resin film or heat insulation equipment of the dc-battery according to claim 6 according [ the lamination means of a sheet ] to hot melt.

[Claim 8] The block object with which pad material was fabricated by foaming in a mold by the bead method A necessary flare area suitably, A slice cut is carried out tabular [ which has thickness / two or more ], and a low melting point resin film is detailed rough minded [ the / which was cut ]. A high-melting resin film Superposition, Heat insulation equipment of a dc-battery given in which term of one to claim 5 term which make a low melting point resin film fuse with heating, make this cut side laminate a high-melting resin film possible [ fluoroscopy of the detailed split-face pattern of a cut side ], and it comes to constitute.

[Claim 9] Heat insulation equipment of the dc-battery according to claim 8 whose foaming object is a polypropylene resin foaming object and a low melting point resin film and whose high-melting resin film are a low melting point polypropylene resin film and a high-melting polypropylene resin film.

[Claim 10] Heat insulation equipment of the dc-battery which laminates a resin film and is characterized cover the peripheral-wall perimeter of a dc-battery case, fabricate by foaming in a mold by the bead method, and possible to the magnitude of dc-battery case peripheral-wall extensive form-like size, and the made foaming body surface by fluoroscopy of having \*\*\*\*(ed) the pad material which it comes to constitute and carrying out conclusion immobilization of the periphery with a stop band further of this front face.

[Claim 11] Heat insulation equipment of the dc-battery which covers the peripheral-wall perimeter of a dc-battery case, fabricates by foaming in a mold by the bead method, laminates a resin film and is characterized possible by fluoroscopy of \*\*\*\*(ing) the pad material which it comes to constitute, carrying out the polymerization of the edge of each other, and coming to carry out stop immobilization of this front face in the magnitude of dc-battery case peripheral-wall extensive form-like size, and the made foaming body surface.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] It is related with the heat insulation equipment of the dc-battery called for that winter controls discharge prevention and, especially as for this invention, a summer controls a temperature rise.

[0002]

[Description of the Prior Art] In the extensive temperature requirement from the low temperature of winter to [ incubation of a dc-battery and heat insulation ] the elevated temperature of midsummer Heat insulation, The embrittlement prevention at the outside where incubation is called for, and the time of low temperature, incubation confidentiality, the fit nature that cancels a clearance to a dc-battery, There are many quality characteristics demanded extremely, such as the simple quick nature of setting at dc-battery works, removal at the time of transshipment of a discharge dc-battery, the ease of anchoring, oilproof and chemical resistance, thermal resistance, recycle nature, thickness (8-10mm), economical efficiency, and a high-class feeling. however , the interior of what twisted and carried out the band stop of urethane or the extrusion mat to the ex battery limit side as heat insulation equipment of the dc-battery with which such [ conventionally ] a property be search for , and epidermis be fill up with polyester sponge or a glass fiber , incubation covering which made the perimeter flatten be create and most heat insulators which be satisfied with extent cover to an ex battery limit periphery of the quality characteristic like the above enough be find out .

[0003] And incubation covering of the dc-battery used now [ above-mentioned ] can also be referred to as conforming to the incubation heat insulation purpose, and does not escape the difficulty from which creation takes many time and effort to a man day, and it serves as cost quantity. And it has the difficulty that a problem is in recycle nature since it consists of a compound material, and installation, removal, and fit nature with a dc-battery are also missing.

[0004]

[Problem(s) to be Solved by the Invention] This invention copes with the actual condition like \*\*\*\*, and manufacture is easy and especially tends to form it with a single material. In the heat insulation equipment of a dc-battery, an appearance is beautiful by finding out the heat insulation pad material which satisfies each quality characteristic for which said especially dc-battery shielding (incubation pad) is asked. Winter Discharge prevention, While a summer prevents a temperature rise and being able to avoid evapotranspiration of liquid, it aims at satisfying said property and attaining removal of the pad at the time of transshipment of a discharge dc-battery, and the ease of anchoring.

[0005]

[Means for Solving the Problem] That is, the description of this invention which suits the above-mentioned purpose installs the pad material which becomes the lateral surface of a dc-battery case from the foaming object of a necessary configuration as heat insulation equipment of a dc-battery fundamentally, this case is \*\*\*\*(ed) by this, and it is in aiming at heat insulation protection. While specifically preparing first the hook-like \*\*\*\* engagement section which \*\*\*\* pad material in the peripheral face comparison-lower location of a dc-battery case A lock pin is protruded on an up location, said lock pin protrusion location of the pad material which consists of a foaming object is countered, and a crevice is prepared. This pad material \*\*\*\* the lower part in said \*\*\*\* engagement section, a pad material crevice is made to carry out fitting of the upside lock pin, and a dc-battery case periphery wall surface is equipped. And the pad material installed in each wall surface at the corner section formed of the wall surface which adjoins mutually [ dc-battery case periphery each wall surface ] is inserted. The space formation member which carries out partition formation of the space which can be held is protruded, it is possible to insert the pad material which consists of a foaming object in the space formed of each adjoining space formation member, respectively, and to \*\*\*\* said dc-battery case periphery wall surface, and this invention is characterized also by these concrete configurations.

[0006] In each above-mentioned concrete configuration, pad material uses the foaming object by which independent formation was respectively carried out corresponding to dc-battery case periphery each wall surface.

[0007] Moreover, this invention is crossed to the peripheral-wall perimeter of a dc-battery case as other concrete modes of the heat insulation equipment of a dc-battery. Fabricate by foaming in a mold by the bead method, and to the magnitude of dc-battery case peripheral-wall extensive form-like size, and the made foaming body surface Possible [ fluoroscopy of this front face ], laminate a resin film and the pad material which it comes to constitute is \*\*\*\*(ed). The periphery is crossed to the peripheral-wall perimeter of carrying out conclusion immobilization with a stop band further, and a dc-battery case. It is also the description to fabricate by foaming in a mold by the bead method, and to \*\*\*\* the pad material which laminates a resin film and it comes to constitute to the magnitude of dc-battery case peripheral-wall extensive form-like size and the made foaming body surface, it to make possible the polymerization of the fluoroscopy of the edge of each other of this front face, and to carry out stop immobilization.

[0008] And although use of the foaming object by extrusion molding is also possible as a foaming object of each pad material of these heat insulation equipment The foaming object in a mold especially by the bead method is suitable, and is divided, and a low

melting point resin film is minded [ of the foaming object in a mold by the bead method for having a rough front face / this ]. A high-melting resin film Superposition, The foaming object which made the low melting point resin film fuse with heating, and made the foaming body surface laminate a high-melting film, or the block object fabricated by foaming in a mold by the bead method A necessary flare area suitably, A slice cut is carried out tabular [ which has thickness / two or more ], and a low melting point resin film is detailed rough minded [ the / which was cut ]. A high-melting resin film Superposition, The foaming object of an appearance which made the low melting point resin film fuse with heating, and made this cut side laminate the detailed split-face pattern of a cut side for a high-melting resin film possible [ fluoroscopy ] like a crepe pattern is good, and is the advantageous material of this invention.

[0009] The pad material which consists of a foaming object whose foaming object in a mold is a polypropylene resin foaming object, and a low melting point resin film and whose high-melting resin film are a low melting point polypropylene resin film and a high-melting polypropylene resin film especially is the most suitable practically.

[0010]

[Function] By use of the pad which consists of a foaming object according to said this invention heat insulation equipment, with evapotranspiration prevention of incubation adiathermic and liquid according especially to the embrittlement prevention at the time of low temperature and the discharge prevention at the time of winter low temperature, and the temperature up control at the time of a summer elevated temperature Cheap [ make adsorption of removal of the fit nature of a pad and a dc-battery and the pad at the time of transshipment of a discharge dc-battery, the ease of anchoring, setting nature, oilproof and chemical resistance, the oil by the surface skin, water, and dust, prevention of water absorption, and thickness and ]. And almost, while satisfying the various quality characteristics for which dc-battery shielding, such as a high-class feeling, is asked, if also in the recycle nature by the single material, they are closed further.

[0011] In addition, when using the pad which consists of a foaming object which laminated the high-melting film through low melting point resin on the foaming object in a mold, through a film, like a crepe pattern, the phanerosis of the split face where the foaming body surface was rough is carried out, and it presents a beautiful appearance. And a foaming object becomes that productive efficiency is good and a man day is also easy productive efficiency and economical.

[0012]

[Example] Hereafter, with reference to an accompanying drawing, the example of this invention is explained further.

[0013] Drawing 1 - drawing 6 are each example of the dc-battery heat insulation equipment concerning this invention, and drawing 7 - drawing 9 are the examples of the pad material used for this invention.

[0014] The dc-battery case where 1 connotes a dc-battery in drawing 1 , and 2a-2d, each pad material which consists of a foaming object is shown, respectively, the perimeter of dc-battery case 1 outside is surrounded, and each pad material 2a-2d is installed, respectively.

[0015] Drawing 1 b shows the detail of the installation structure to the above-mentioned pad material [ 2a-2d (2 shows collectively) ] dc-battery case 1 in the cross section. While forming the \*\*\*\* engagement section 3 for carrying out \*\*\*\* engagement of the pad material 2 in the paries-lateralis-orbitae side comparison-lower location of the dc-battery case 1 The upper part is made to carry out protrusion formation of the lock pin 4, each pad material 2a-2d is doubled with each above-mentioned wall surface, respectively, the lower part is caught in said \*\*\*\* engagement section, said lock pin 4 is made to insert in the pad material upper part, and the upper part is making it install. In this case, it is made to make the crevice form in \*\*\*\*\* of the upside lock pin 4 in order to close insertion of a lock pin 4 to the pad material 2 side, if . 2e is pad material on top. In the corner section formed of the wall surface which drawing 2 and drawing 3 are the examples of installation structure concerning an example other than the above-mentioned example, and adjoins mutually [ dc-battery case 1 periphery each wall surface ] instead of said \*\*\*\* engagement section 3 in drawing 2 Insertion maintenance is carried out and installation \*\*\*\* of the pad material 2a-2d which consists of a foaming object which it protrudes in the shape of an arrow head towards the method of outside, and the space formation member 5 which carries out partition formation of the space which can carry out insertion maintenance of the pad material 2a-2d is formed in both sides, and was formed in the space divided by this at trapezoidal shape, respectively is carried out.

[0016] On the other hand, L-like space formation member 5' by which a base extends to an opposite direction with an L type as the space formation member 5' same instead of the space formation member 5 of the above-mentioned arrow-head configuration, and drawing 3 forms \*\*-like space in both sides is used, and insertion maintenance of the shape of a pad 2a-2d is carried out by both \*\*-like space at each wall surface, respectively.

[0017] In addition, various design-alterations are possible for each above-mentioned space formation member 5 and 5' it does not restrict to these configurations, and, in short, the pad material 2 is inserted, and just possible [ maintenance ]. As this space formation member, although there are resin, a metal, etc., polyolefine system resin is desirable.

[0018] Furthermore, although the pad material installed on dc-battery case 1 wall surface in each above-mentioned example is what was respectively formed in independent in each wall surface, pad material may not be what not necessarily became independent, it can form pad material as an one-sheet thing, and it can also \*\*\*\* it so that this may be wound around the surroundings of a HATTERI case outer wall and may be surrounded.

[0019] Drawing 4 - drawing 6 are an example of a configuration in such a case, and as shown in each drawing, after they carry out installation \*\*\*\* of the pad material 2 of an one-sheet thing in dc-battery case external surface, they need to carry out stop immobilization with the stop band 6 or the engagement implement 8.

[0020] Although the band which is made engaged at the usual both ends as drawing 4 and a stop band 6 of drawing 5 , and is fixed with a bundle is sufficient, in order to ensure stop immobilization more, as shown in drawing 5 (b) and (c), the projected part 7 is formed in band 6 inside, and means, such as carrying out press fit fitting, may be adopted as the crevice which prepared this in the pad material 2.

[0021] Moreover, as an engagement implement 8 in drawing 6 , various means, such as each known engagement means, for example,

a hook type, and a cloth fastener type, are possible. And if the edge of the pad material engaged in this case is fabricated to \*\*\*\*\* , an exterior and a smooth next door beautiful will be maintained.

[0022] As mentioned above, even if various modes differ, the adiabatic efficiency of this invention is attained by installing the pad material 2 which consists of a foaming object in short to a dc-battery case 1 paries-lateralis-orbitae side.

[0023] In addition, although the above-mentioned explanation mainly described the peripheral wall of a dc-battery case outer wall, of course, the above-mentioned pad material is similarly used to a terminal and existing top faces, such as a liquid covering device. In this case, when forming the pad material 2 as a series of one-sheet things, it creates as a configuration which connected the top-face section in the shape of [ which developed the ex-battery-limit side-attachment-wall side ] a rectangle. However, it is necessary to say preparing opening to neither a terminal nor the part in which \*\*\*\* exists.

[0024] It is the foaming object fabricated by the foaming object fabricated by extrusion molding as a foaming object used for the above-mentioned pad material 2 of this invention heat insulation equipment, and foaming in a mold, and the latter foaming object is effective especially.

[0025] The foaming object by foaming in this mold uses a fizz resin particle (foaming bead) as a raw material, is filled up with this in a sex mold, and are heating welding and the thing which was made to cool and was fabricated for the product. It is also easy for foaming in a mold to be possible, for example, to fold up so that the gestalt or the perimeter of outside each wall surface of a dc-battery can be surrounded, to fabricate a part in an oblong short form configuration as a thin-walled part at any time, according to each gestalt, and to prepare an opening aperture in lobes, such as a terminal, if needed. That what is necessary is just resin in which foaming in a mold is possible as resin which forms this foaming object For example, low density polyethylene, high density polyethylene, straight chain-like low density polyethylene, Polyethylene system resin, such as a copolymer of an ethylene-propylene, a polypropylene homopolymer, The block copolymer of a propylene, the random copolymer of ethylene and a propylene, and ethylene, Although various resin, such as polypropylene regins, such as a propylene-ethylene-butene terpolymer, polystyrene, an acrylic nitril-styrene copolymer, a methacrylic acid ester-styrene copolymer, and a copolymer of polystyrene and polyethylene, can be mentioned Polyolefine system resin, such as polyethylene system resin and a polypropylene regin, is common, and the polypropylene regin foaming object is especially the most practical.

[0026] The shank pattern on a tortoise shell is formed in that front face of the welding of an expansion bead, and the foaming object by foaming in this mold usually has the detailed split face the bottom coarsely. Therefore, although you may use as a simple substance as it is, it is suitable to use it, making the front face fuse superposition and a low melting point resin film for a high-melting resin film through a low melting point resin film, and making a high-melting resin film laminate at the point of closing an appearance if . Moreover, it is also desirable to close, if [ in an appearance ] by carrying out melting of the low melting point thermoplastics of a polyolefine system, coating a foaming object side, and pasting up an epidermis film (hot melt).

[0027] Drawing 7 - drawing 9 are the modes in the case of laminating a resin film in the foaming body surface in these molds, and the foaming object with which 11 were fabricated by foaming in a mold by the bead method, and 12 are the high-melting resin films piled up through the low melting point resin film 13 among drawing.

[0028] Although the front face is a field the bottom coarsely, the foaming object 11 by foaming in a mold here The low melting point resin film 13 is inserted. The high-melting resin film 12 Superposition, If melting of the low melting point resin film 13 is carried out and the high-melting resin film 12 is laminated in a foaming body surface by heating to the temperature which exceeds the melting temperature of the low melting point resin film 13 from a proper heating means The detailed split face of foaming object 11 front face is seen through through the high-melting resin film 12, and a surface hexagonal pattern or a detailed split face presents a peculiar appearance, appears patterns, such as a crepe pattern, and if it is beautiful, it closes an appearance.

[0029] In addition, as shown not only in the case of a simple substance but in drawing 8 , the foaming object 11 in a mold has necessary area, after fabricating as a block object B which has thickness suitably, can carry out the slice cut of this in the thickness direction, and can once form it in the foaming object 11 which makes tabular [ of necessary thickness ] .

[0030] Thus, the foaming object 11 of two or more predetermined gestalten only by carrying out a slice cut, if it fabricates as a block object B is formed. A cut side turns into a detailed split face at coincidence, and a low melting point resin film is rough minded [ which was cut the same with having mentioned above since then ] . A high-melting resin film Superposition, The welding lamination of the high-melting resin film can be carried out on the rough front face of the foaming object 11, and patterns, such as a crepe pattern, can be made to appear through a high-melting resin sheet the back by fusing a low melting point resin film.

[0031] In addition, the low melting point resin film 13 and the high-melting resin film 12 which are put on the rough front face of the above-mentioned foaming object 11 are usable if polyethylene system resin, a polypropylene regin, polyethylene terephthalate (PET), etc. are thermoplastics films, and about 100-120 degrees C of 80-130 degrees C of 140 degrees C or more of melting temperature of the high-melting resin film 12 of the melting temperature of the low melting point resin film 13 are usually 170 degrees C or more preferably.

[0032] However, it is desirable that it is resin the same or affiliated, and it is most desirable that it is resin moreover still the same as that also of the formation resin of the foaming object 11 or affiliated. [ with both / these / the as much as possible resin films 12 and 13 ] Especially, especially as for the most practical thing, a foaming object and both the resin film use a polypropylene regin.

[0033] Although the pad material which consists of a foaming object which has improved the appearance of such a foaming object in a mold is used in all the modes mentioned above When it is also one sheet and especially carries out surrounding \*\*\*\* of the perimeter of a dc-battery case, are suitable. If it bends by V groove 14 which formed extensive form-like pad material as shown in drawing 9 , and was formed in thin meat and is made to \*\*\*\* around a dc-battery, by the beautiful appearance It is lightweight and attaches, and the workability of removal is also good and the heat insulation pad of the dc-battery which fully possesses said quality characteristic for which dc-battery shielding is asked can be obtained.

[0034]

[Effect of the Invention] This invention installs the pad material which becomes the lateral surface of a dc-battery case from the foaming object of the necessary configuration by extrusion molding and foaming in a mold as mentioned above. While making this

lateral surface able to \*\*\*\*, and the use of material which consists of said foaming object being able to protect not only the discharge prevention at the time of low temperature but also the rise of temperature on the occasion of heat insulation of a dc-battery in a summer and being able to prevent evapotranspiration of the electrolytic solution The quality characteristic for which various dc-battery shielding, such as adsorption of the fit nature to a dc-battery, the ease at the time of discharge dc-battery transshipment, oilproof and chemical resistance, the oil by the surface skin, water, dust, etc. and prevention of water absorption, is asked is satisfied, and it has very remarkable effectiveness.

[0035] And since said adiabatic efficiency [ according to claim 2 to 4 ] sufficient by just adding like and easy processing for a dc-battery case can be mentioned, it is extremely rich in practicality conjointly with the ease of exchange.

[0036] moreover, the gestalt of versatility when using the foaming object by foaming in a mold — shaping — it is easy, and when carrying out a slice cut and using a block object especially, cost reduction is measured upwards and it is very advantageous.

[0037] Furthermore, a high-melting resin film is laminated by melting of a low melting point resin film on the foam front face in a mold as pad material. When making the split face on the front face of foam see through as a pattern like a crepe pattern through this laminate film, while it closes the pad material which \*\*\*\*\* (ed) to the dc-battery if, and making practical value improve When forming a foaming object and a resin film by single material, various efficiency, such as excelling in recycle nature, can be attained.

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TECHNICAL FIELD

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[Industrial Application] It is related with the heat insulation equipment of the dc-battery called for that winter controls discharge prevention and, especially as for this invention, a summer controls a temperature rise.

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PRIOR ART

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[Description of the Prior Art] The embrittlement prevention at the outside where incubation of a dc-battery and heat insulation are asked for heat insulation and incubation in the extensive temperature requirement which results in the elevated temperature of midsummer from the low temperature of winter, and the time of low temperature, incubation confidentiality, the fit nature that cancels a clearance to a dc-battery, the simple quick nature of setting at dc-battery works, removal at the time of transshipment of a discharge dc-battery, the ease of anchoring, oilproof and chemical resistance, thermal resistance, recycle nature, thickness (8-10mm), There are many quality characteristics demanded extremely, such as economical efficiency and a high-class feeling. however , the interior of what twisted and carried out the band stop of urethane or the extrusion mat to the ex battery limit side as heat insulation equipment of the dc-battery with which such [ conventionally ] a property be search for , and epidermis be fill up with polyester sponge or a glass fiber , incubation covering which made the perimeter flatten be create and most heat insulators which be satisfied with extent cover to an ex battery limit periphery of the quality characteristic like the above enough be find out . [0003] And incubation covering of the dc-battery used now [ above-mentioned ] can also be referred to as conforming to the incubation heat insulation purpose, and does not escape the difficulty from which creation takes many time and effort to a man day, and it serves as cost quantity. And it has the difficulty that a problem is in recycle nature since it consists of a compound material, and installation, removal, and fit nature with a dc-battery are also missing.

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EFFECT OF THE INVENTION

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[Effect of the Invention] This invention installed the pad material to which it becomes the lateral surface of a dc-battery case from the foaming object of the necessary configuration by extrusion molding and foaming in a mold as mentioned above, and was made to \*\*\*\* this lateral surface. While being, and the use of pad material which consists of said foaming object being able to protect not only the discharge prevention at the time of low temperature but also the rise of temperature on the occasion of heat insulation of a dc-battery in a summer and being able to prevent evapotranspiration of the electrolytic solution The quality characteristic for which various dc-battery shielding, such as adsorption of the fit nature to a dc-battery, the ease at the time of discharge dc-battery transshipment, oilproof and chemical resistance, the oil by the surface skin, water, dust, etc. and prevention of water absorption, is asked is satisfied, and it has very remarkable effectiveness.

[0035] And since said adiabatic efficiency [ according to claim 2 to 4 ] sufficient by just adding like and easy processing for a dc-battery case can be mentioned, it is extremely rich in practicality conjointly with the ease of exchange.

[0036] moreover, the gestalt of versatility when using the foaming object by foaming in a mold — shaping — it is easy, and when carrying out a slice cut and using a block object especially, cost reduction is measured upwards and it is very advantageous.

[0037] Furthermore, when a high-melting resin film is laminated by melting of a low melting point resin film on the foam front face in a mold as pad material and the split face on the front face of foam is made to see through as a pattern like a crepe pattern through this laminate film While the pad material which \*\*\*\*\* (ed) to the \*\* dc-battery is closed if , and making practical value improve, when forming a foaming object and a resin film by single material, various efficiency, such as excelling in recycle nature, can be attained.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] This invention copes with the actual condition like \*\*\*, and manufacture is easy and especially tends to form it with a single material. In the heat insulation equipment of a dc-battery, an appearance is beautiful by finding out the heat insulation pad material which satisfies each quality characteristic for which said especially dc-battery shielding (incubation pad) is asked. Winter Discharge prevention, While a summer prevents a temperature rise and being able to avoid evapotranspiration of liquid, it aims at satisfying said property and attaining removal of the pad at the time of transshipment of a discharge dc-battery, and the ease of anchoring.

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## MEANS

[Means for Solving the Problem] That is, the description of this invention which suits the above-mentioned purpose installs the pad material which becomes the lateral surface of a dc-battery case from the foaming object of a necessary configuration as heat insulation equipment of a dc-battery fundamentally, this case is \*\*\*\*(ed) by this, and it is in aiming at heat insulation protection. While specifically preparing first the hook-like \*\*\*\* engagement section which \*\*\*\* pad material in the peripheral face comparison-lower location of a dc-battery case A lock pin is protruded on an up location, said lock pin protrusion location of the pad material which consists of a foaming object is countered, and a crevice is prepared. This pad material \*\*\*\* the lower part in said \*\*\*\* engagement section, a pad material crevice is made to carry out fitting of the upside lock pin, and a dc-battery case periphery wall surface is equipped, And the pad material installed in each wall surface at the corner section formed of the wall surface which adjoins mutually [ dc-battery case periphery each wall surface ] is inserted. The space formation member which carries out partition formation of the space which can be held is protruded, it is possible to insert the pad material which consists of a foaming object in the space formed of each adjoining space formation member, respectively, and to \*\*\*\* said dc-battery case periphery wall surface, and this invention is characterized also by these concrete configurations.

[0006] In each above-mentioned concrete configuration, pad material uses the foaming object by which independent formation was respectively carried out corresponding to dc-battery case periphery each wall surface.

[0007] Moreover, this invention is crossed to the peripheral-wall perimeter of a dc-battery case as other concrete modes of the heat insulation equipment of a dc-battery. Fabricate by foaming in a mold by the bead method, and to the magnitude of dc-battery case peripheral-wall extensive form-like size, and the made foaming body surface Possible [ fluoroscopy of this front face ], laminate a resin film and the pad material which it comes to constitute is \*\*\*\*(ed). The periphery is crossed to the peripheral-wall perimeter of carrying out conclusion immobilization with a stop band further, and a dc-battery case. It is also the description to fabricate by foaming in a mold by the bead method, and to \*\*\*\* the pad material which laminates a resin film and it comes to constitute to the magnitude of dc-battery case peripheral-wall extensive form-like size and the made foaming body surface, it to make possible the polymerization of the fluoroscopy of the edge of each other of this front face, and to carry out stop immobilization.

[0008] And although use of the foaming object by extrusion molding is also possible as a foaming object of each pad material of these heat insulation equipment The foaming object in a mold especially by the bead method is suitable, and is divided, and a low melting point resin film is minded [ of the foaming object in a mold by the bead method for having a rough front face / this ]. A high-melting resin film Superposition, The foaming object which made the low melting point resin film fuse with heating, and made the foaming body surface laminate a high-melting film, or the block object fabricated by foaming in a mold by the bead method A necessary flare area suitably, A slice cut is carried out tabular [ which has thickness / two or more ], and a low melting point resin film is detailed rough minded [ the / which was cut ]. A high-melting resin film Superposition, The foaming object of an appearance which made the low melting point resin film fuse with heating, and made this cut side laminate the detailed split-face pattern of a cut side for a high-melting resin film possible [ fluoroscopy ] like a crepe pattern is good, and is the advantageous material of this invention.

[0009] The pad material which consists of a foaming object whose foaming object in a mold is a polypropylene resin foaming object, and a low melting point resin film and whose high-melting resin film are a low melting point polypropylene resin film and a high-melting polypropylene resin film especially is the most suitable practically.

[Translation done.]

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OPERATION

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[Function] They are incubation adiathermic, and the embrittlement prevention at the time of low temperature and the discharge prevention at the time of winter low temperature and evapotranspiration prevention of liquid according to the temperature-up control at the time of a summer elevated temperature especially by the activity of the pad which consists of a foaming object according to said this invention heat insulation equipment, Cheap [ make adsorption of removal of the fit nature of a pad and a dc-battery and the pad at the time of transshipment of a discharge dc-battery, the ease of anchoring, setting nature, oilproof and chemical resistance, the oil by the surface skin, water, and dust, prevention of water absorption, and thickness and ]. And almost, while satisfying the various quality characteristics for which dc-battery shielding, such as a high-class feeling, is asked, if also in the recycle nature by the single raw material, they are closed further.

[0011] In addition, when using the pad which consists of a foaming object which laminated the high-melting film through low melting point resin on the foaming object in a mold, through a film, like a crepe pattern, the phanerosis of the split face where the foaming body surface was rough is carried out, and it presents a beautiful appearance. And a foaming object becomes that productive efficiency is good and manday is also easy productive efficiency and economical.

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[Translation done.]

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## EXAMPLE

[Example] Hereafter, with reference to an accompanying drawing, the example of this invention is explained further.

[0013] Drawing 1 - drawing 6 are each example of the dc-battery heat insulation equipment concerning this invention, and drawing 7 - drawing 9 are the examples of the pad material used for this invention.

[0014] The dc-battery case where 1 connotes a dc-battery in drawing 1 , and 2a-2d, each pad material which consists of a foaming object is shown, respectively, the perimeter of dc-battery case 1 outside is surrounded, and each pad material 2a-2d is installed, respectively.

[0015] Drawing 1 b shows the detail of the installation structure to the above-mentioned pad material [ 2a-2d (2 shows collectively) ] dc-battery case 1 in the cross section. While forming the \*\*\*\* engagement section 3 for carrying out \*\*\*\* engagement of the pad material 2 in the outside wall surface comparison-lower location of the dc-battery case 1 The upper part is made to carry out protrusion formation of the lock pin 4, each pad material 2a-2d is doubled with each above-mentioned wall surface, respectively, the lower part is caught in said \*\*\*\* engagement section, said lock pin 4 is made to insert in the pad material upper part, and the upper part is making it install. In this case, it is made to make the crevice form in \*\*\*\*\* of the upside lock pin 4 in order to close insertion of a lock pin 4 to the pad material 2 side, if . 2e is pad material on top. In the corner section formed of the wall surface which drawing 2 and drawing 3 are the examples of installation structure concerning an example other than the above-mentioned example, and adjoins mutually [ dc-battery case 1 periphery each wall surface ] instead of said \*\*\*\* engagement section 3 in drawing 2 Insertion maintenance is carried out and installation \*\*\*\* of the pad material 2a-2d which consists of a foaming object which it protrudes in the shape of an arrow head towards the method of outside, and the space formation member 5 which carries out partition formation of the space which can carry out insertion maintenance of the pad material 2a-2d is formed in both sides, and was formed in the space divided by this at trapezoidal shape, respectively is carried out.

[0016] On the other hand, L-like space formation member 5' by which a base extends to an opposite direction with an L type as the space formation member 5' same instead of the space formation member 5 of the above-mentioned arrow-head configuration, and drawing 3 forms \*\*-like space in both sides is used, and insertion maintenance of the shape of a pad 2a-2d is carried out by both \*\*-like space at each wall surface, respectively.

[0017] In addition, various design-alterations are possible for each above-mentioned space formation member 5 and 5' it does not restrict to these configurations, and, in short, the pad material 2 is inserted, and just possible [ maintenance ]. As this space formation member, although there are resin, a metal, etc., polyolefine system resin is desirable.

[0018] Furthermore, although the pad material installed on dc-battery case 1 wall surface in each above-mentioned example is what was respectively formed in independent in each wall surface, pad material may not be what not necessarily became independent, it can form pad material as an one-sheet thing, and it can also \*\*\*\* it so that this may be wound around the surroundings of a HATTERY case outer wall and may be surrounded.

[0019] Drawing 4 - drawing 6 are an example of a configuration in such a case, and as shown in each drawing, after they carry out installation \*\*\*\* of the pad material 2 of an one-sheet thing in a dc-battery case outside surface, they need to carry out stop immobilization with the stop band 6 or the engagement implement 8.

[0020] Although the band which is made engaged at the usual ends as drawing 4 and a stop band 6 of drawing 5 , and is fixed with a bundle is sufficient, in order to ensure stop immobilization more, as shown in drawing 5 (b) and (c), the projected part 7 is formed in band 6 inner surface, and means, such as carrying out press fit fitting, may be adopted as the crevice which prepared this in the pad material 2.

[0021] Moreover, as an engagement implement 8 in drawing 6 , various means, such as each known engagement means, for example, a hook type, and a cloth fastener type, are possible. And if the edge of the pad material engaged in this case is fabricated to \*\*\*\*, it will become an exterior and smoothness and beautiful will be maintained.

[0022] As mentioned above, even if various modes differ, the adiabatic efficiency of this invention is attained by installing the pad material 2 which consists of a foaming object in short on a dc-battery case 1 outside wall surface.

[0023] In addition, although the above-mentioned explanation mainly described the peripheral wall of a dc-battery case outer wall, of course, the above-mentioned pad material is similarly used to a terminal and existing top faces, such as a liquid covering device. In this case, when forming the pad material 2 as a series of one-sheet things, it creates as a configuration which connected the top-face section in the shape of [ which developed the dc-battery outside wall surface ] a rectangle. However, it is necessary to say preparing opening to neither a terminal nor the part in which \*\*\*\* exists.

[0024] It is the foaming object fabricated by the foaming object fabricated by extrusion molding as a foaming object used for the above-mentioned pad material 2 of this invention heat insulation equipment, and foaming in a mold, and the latter foaming object is effective especially.

[0025] The foaming object by foaming in this mold uses a fizz resin particle (foaming bead) as a raw material, is filled up with this in a sex mold, and are heating welding and the thing which was made to cool and was fabricated for the product. It is also easy for

foaming in a mold to be possible, for example, fold up so that the gestalt or the perimeter of the inside each wall surface of a dc-battery can be surrounded, to fabricate a part in an oblong short form configuration as a thin-walled part at any time, according to each gestalt, and to prepare an opening aperture in lobes, such as a terminal, if needed. That what is necessary is just resin in which foaming in a mold is possible as resin which forms this foaming object. For example, low density polyethylene, high density polyethylene, straight chain-like low density polyethylene, Polyethylene system resin, such as a copolymer of an ethylene-propylene, a polypropylene homopolymer, The block copolymer of a propylene, the random copolymer of ethylene and a propylene, and ethylene. Although various resin, such as polypropylene resins, such as a propylene-ethylene-butene terpolymer, polystyrene, an acrylic nitril-styrene copolymer, a methacrylic acid ester-styrene copolymer, and a copolymer of polystyrene and polyethylene, can be mentioned. Polyolefine system resin, such as polyethylene system resin and a polypropylene resin, is common, and the polypropylene resin foaming object is especially the most practical.

[0026] The shank pattern on a tortoise shell is formed in that front face of the welding of an expansion bead, and the foaming object by foaming in this mold usually has the detailed split face the bottom coarsely. Therefore, although you may use as a simple substance as it is, it is suitable to use it, making the front face fuse superposition and a low melting point resin film for a high-melting resin film through a low melting point resin film, and making a high-melting resin film laminate at the point of closing an appearance if. Moreover, it is also desirable to close, if [ in an appearance ] by carrying out melting of the low melting point thermoplastics of a polyolefine system, coating a foaming object side, and pasting up an epidermis film (hot melt).

[0027] Drawing 7 - drawing 9 are the modes in the case of laminating a resin film in the foaming body surface in these molds, and the foaming object with which 11 were fabricated by foaming in a mold by the bead method, and 12 are the high-melting resin films piled up through the low melting point resin film 13 among drawing.

[0028] Although the front face is a field the bottom coarsely, the foaming object 11 by foaming in a mold here. The low melting point resin film 13 is inserted. The high-melting resin film 12 Superposition, If melting of the low melting point resin film 13 is carried out and the high-melting resin film 12 is laminated in a foaming body surface by heating to the temperature which exceeds the melting temperature of the low melting point resin film 13 from a proper heating means. The detailed split face of foaming object 11 front face is seen through through the high-melting resin film 12, and a surface hexagonal pattern or a detailed split face presents a peculiar appearance, appears patterns, such as a crepe pattern, and if it is beautiful, it closes an appearance.

[0029] In addition, as shown not only in the case of a simple substance but in drawing 8, the foaming object 11 in a mold has necessary area, after fabricating as a block object B which has thickness suitably, can carry out the slice cut of this in the thickness direction, and can once form it in the foaming object 11 which makes tabular [ of necessary thickness ].

[0030] Thus, the foaming object 11 of two or more predetermined gestalten only by carrying out a slice cut, if it fabricates as a block object B is formed. Simultaneously, a cut side turns into a detailed split face, and a low melting point resin film is rough minded [ which was cut same with having mentioned above since then ]. A high-melting resin film Superposition, The welding lamination of the high-melting resin film can be carried out on the rough front face of the foaming object 11, and patterns, such as a crepe pattern, can be made to appear through a high-melting resin sheet the back by fusing a low melting point resin film.

[0031] In addition, the low melting point resin film 13 and the high-melting resin film 12 which are put on the rough front face of the above-mentioned foaming object 11 are usable if polyethylene system resin, a polypropylene resin, polyethylene terephthalate (PET), etc. are thermoplastics films, and about 100-120 degrees C of 80-130 degrees C of 140 degrees C or more of melting temperature of the high-melting resin film 12 of the melting temperature of the low melting point resin film 13 are usually 170 degrees C or more preferably.

[0032] However, it is desirable that it is resin the same or affiliated, and it is most desirable that it is resin moreover still the same as that also of the formation resin of the foaming object 11 or affiliated. [ with both / these / the as much as possible resin films 12 and 13 ] Especially, especially as for the most practical thing, a foaming object and both the resin film use a polypropylene resin.

[0033] Although the pad material which consists of a foaming object which has improved the appearance of such a foaming object in a mold is used in all the modes mentioned above. When it is also one sheet and especially carries out surrounding \*\*\*\* of the perimeter of a dc-battery case, are suitable. If it bends by V groove 14 which formed the pad material of an expansion configuration as shown in drawing 9, and was formed in thin meat and is made to \*\*\*\* around a dc-battery, by the beautiful appearance. It is lightweight, the workability of installation and removal is also good, and the heat insulation pad of the dc-battery which fully possesses said quality characteristic for which dc-battery shielding is asked can be obtained.

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[Translation done.]

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DESCRIPTION OF DRAWINGS

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## [Brief Description of the Drawings]

- [Drawing 1] It is drawing showing one example of the heat insulation equipment of the dc-battery concerning this invention, and (a) is a perspective view and (b) is a fragmentary sectional view.
- [Drawing 2] It is plane-cross-section drawing showing other examples of this invention heat insulation equipment.
- [Drawing 3] It is plane-cross-section drawing showing the example of further others of this invention heat insulation equipment.
- [Drawing 4] It is the strabism external view showing the example of this invention heat insulation equipment using a stop band.
- [Drawing 5] It is the example of further others of this invention heat insulation equipment using a stop band, and (a) is a cross section where an appearance perspective view and (b) show a stop band schematic diagram, and (c) shows a band stop mode.
- [Drawing 6] The example of this invention heat insulation equipment using a stop fastener is shown, (a) is a strabism external view and (b) is an engagement section release state diagram.
- [Drawing 7] the example of a configuration of the foaming object used for this invention heat insulation equipment is shown — it is a cross-section schematic diagram a part.
- [Drawing 8] It is the front view showing a SURAITO cut condition advantageous to creating a foaming object.
- [Drawing 9] It is the strabism schematic diagram showing the condition of having created the foaming object to dc-battery shielding.

## [Description of Notations]

- 1 Dc-battery Case
  - 2 Pad Material
  - 2a-2e Each pad material
  - 3 \*\*\*\* Engagement Section
  - 4 Lock Pin
  - 5 and 5' space formation member
  - 6 Stop Band
  - 7 Projected Part
  - 8 Engagement Implement
  - 11 Foaming Object in Mold
  - 12 High-melting Resin Film
  - 13 Low Melting Point Resin Film
  - 14 V Groove
- 

[Translation done.]

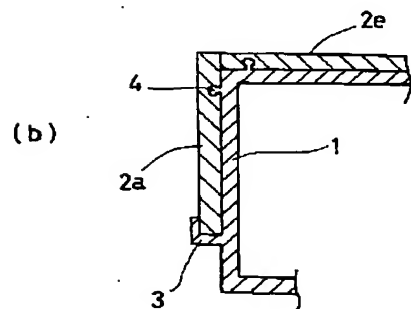
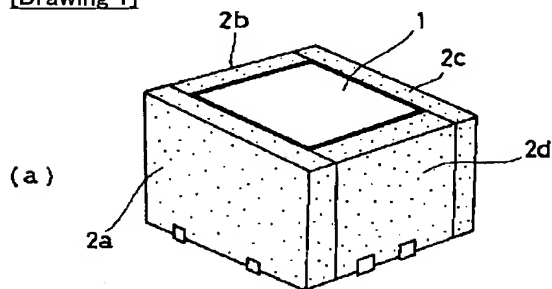
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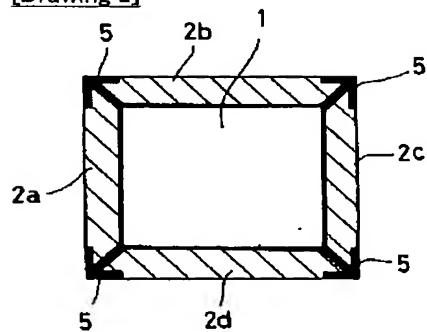
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## DRAWINGS

[Drawing 1]

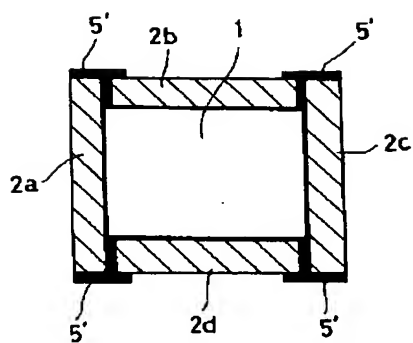


[Drawing 2]

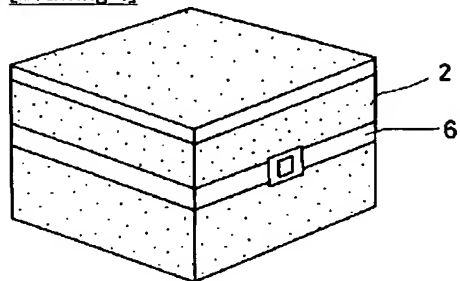


[Drawing 3]

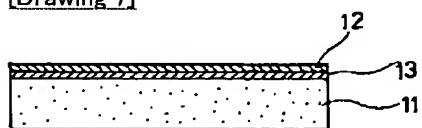




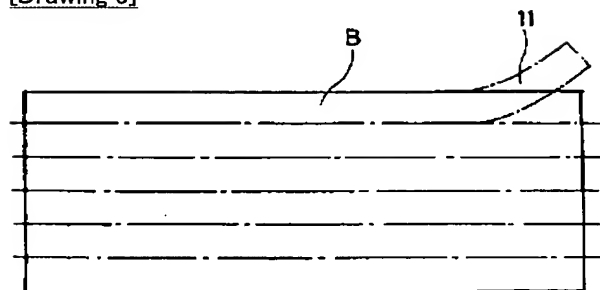
[Drawing 4]



[Drawing 7]

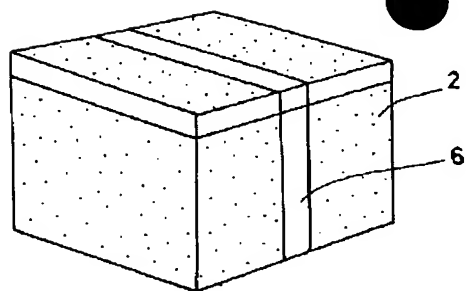


[Drawing 8]

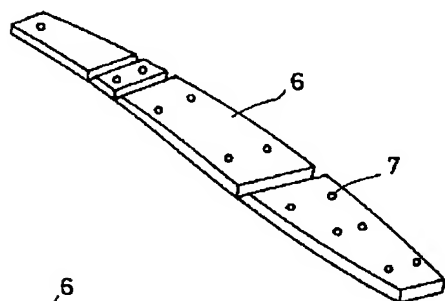


[Drawing 5]

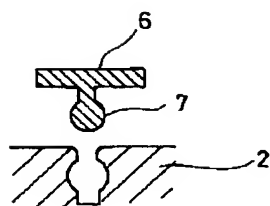
(a)



(b)

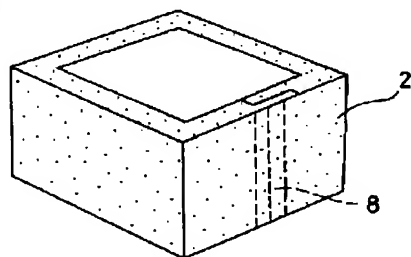


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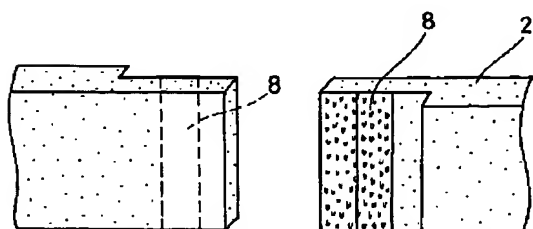


[Drawing 6]

(a)



(b)



[Drawing 9]

